

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 1-5 and 7-21 are now pending in this application.

Applicants wish to thank the Examiner for the careful consideration given to the claims.

Rejections based on Bossel

Claims 1-5 and 7-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,344,290 (“Bossel”) and U.S. Patent 5,645,626 (“Edlund”). For at least the following reasons, this rejection is traversed.

Claim 1 (as amended) recites, among other things, a cell plate, an electroconductive gas separator, and a holder member. The cell plate is provided with: a supporting body including a porous metal plate and an inner annular bulk metal member which is a gas impermeable member and disposed to be radially adjacent to the porous metal plate; and a cell formed on the supporting body. The cell includes a solid electrolyte layer, a cathode substance layer formed on one surface of the solid electrolyte layer, and an anode substance layer formed on the other surface of the solid electrolyte layer. The electroconductive gas separator cooperates with the cell plate to form a gas passage. The holder member holds the supporting body of the cell plate at the inner annular bulk metal member thereof.

Because of the specific structure of claim 1 (especially, the holder member holding the supporting body of the cell plate at the inner annular bulk metal member, which is gas impermeable and disposed to be radially adjacent to the porous metal plate), undue stress to the cell plate (including the cell and the porous metal plate) caused by vibration and heat during the actual usage of the fuel cell can be reduced, resulting in increased reliability of the fuel cell.

No combination of Bossel and Edlund teaches or suggests the combination of features of claim 1. Bossel relates to a fuel cell stack with solid electrolytes. The electric power generating elements of Bossel each including an electrolyte 17, a cathode 18 and an anode 19 formed on a gas-permeable substrate 2 are stacked alternately with respective separating plates 1 spanning between an end plate 29 and an initial plate 30. (Fig. 6 of Bossel.) The fuel

cell stack of Bossel is held via the gas-permeable substrates 2 by respective annular seals 23 at a central portion and via the electric power elements by the separating plates 1 between the end plate 29 and the initial plate 30 and with the aid of the plate springs 31 and the helical spring 32. Bossel does not teach or suggest, for example, “a supporting body including a porous metal plate and an inner annular bulk metal member which is a gas impermeable member and disposed to be radially adjacent to the porous metal plate.” Specifically, the gas-permeable substrate 2 of Bossel (which the PTO considers to be the supporting body of claim 1) does not include an inner annular bulk metal member which is a gas impermeable member (as correctly pointed out on page 3 of the Office Action) and disposed to be radially adjacent to the porous metal plate.

Edlund does not cure this deficiency of Bossel. Edlund relates to a composite hydrogen separator element and module. In the separation element 20 of Edlund, the coating metal member 30 is disposed on a support matrix 31 via an intermediate layer 32. (See Fig. 3a of Edlund.) Also, two pairs of the metal spacers 33 are disposed at the outer peripheral portion of the separation element 20 and the peripheral portion of the central hole 21. (Figs. 2a and 3a of Edlund.) However, both pairs of the metal spacers 33 are disposed on the porous support matrix 31 and not radially adjacent to the porous support matrix 31.¹ (Fig. 3a and column 7, lines 51-60 of Edlund.) Even if one of ordinary skill in the art would have used the metal spacers 33 in the device of Bossel (a point that Applicants do not concede), one of ordinary skill in the art would dispose the metal spacers 33 of Edlund on the gas-permeable substrates 2 of Bossel, not radially adjacent to the gas-permeable substrates 2 of Bossel. Because neither Bossel nor Edlund teaches or suggests an inner annular bulk metal member being disposed radially adjacent to a porous metal plate, the proposed combination of Bossel and Edlund does not render claim 1 unpatentable.

Furthermore no combination of Bossel and Edlund teaches or suggests “a holder member holding the supporting body of the cell plate at the inner annular bulk metal member thereof.” The PTO has asserted that the contact region 22 of Bossel is considered to be the holding member of claim 1. (Page 2 of the Office Action.) However, the contact region is merely the two separating plates 1 and 20 of Bossel being formed in such a way as to contact

¹ It is noted that the coating metal layer 31 is not porous. (Column 8, lines 29-48 of Edlund.)

each other at a non-central aperture 6. (Column 6, lines 51-65 and Figs. 1A and 2 of Bossel.) In other words, the contact region 22 is not a separate element from the separating plate 1 (which the PTO considers to be the cell plate of claim 1) and the separating plate 20 (which the PTO considers to be the electroconductive gas separator). Because the contact region 22 is not a separate element from the separating plate 1 and the separating plate 20, it cannot be considered to be the holding member of claim 1. Edlund does not cure this deficiency. Thus, no combination of Bossel and Edlund would teach or suggest a holder member holding the supporting body of the cell plate at the inner annular bulk metal member thereof, and claim 1 is allowable.

Furthermore, even if one of ordinary skill in the art considered the contact region 22 of Bossel to be the holder member of claim 1 (a point that the Applicants do not concede), the contact region 22 is not located at the central opening 3 of Bossel. As a result, even if one of ordinary skill in the art would have used the metal spacers 33 in the device of Bossel (a point that Applicants do not concede), one of ordinary skill in the art would dispose the metal spacers 33 of Edlund near the central opening 3 of Bossel, not at an off-center aperture 6. Thus, the contact region 22 would not be holding the substrate 2 of Bossel at the metal spacer 33 because the contact region 22 would not be near the metal spacer. Thus, no combination of Bossel and Edlund would teach or suggest a holder member holding the supporting body of the cell plate at the inner annular bulk metal member thereof, and claim 1 is allowable.

Claims 2-5 and 7-21 depend from and contain all the features of claim 1, and are allowable for the same reasons as claim 1, without regard to the further patentable features contained therein.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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